

3-5 Proving lines parallel—Notes

If \parallel , corresponding angles are \cong .
 If \parallel , alternate interior angles are \cong .
 If \parallel , alternate exterior angles are \cong .
 If \parallel , consecutive (same-side) interior angles are supplementary.

Converses are true as well.

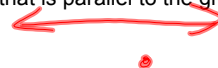
Postulate 3.4—If corresponding angles are \cong , then the lines are \parallel .

Theorem 3.7—If alternate interior angles are \cong , then the lines are \parallel .

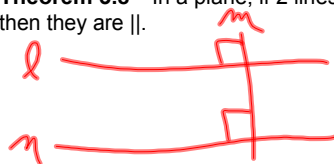
Theorem 3.5—If alternate exterior angles are \cong , then the lines are \parallel .

Theorem 3.6—If consecutive (same-side) interior angles are supplementary, then the lines are \parallel .

Postulate 3.5—The Parallel Postulate—If given a line and a point not on the line, then there exists exactly one line through the point that is parallel to the given line.



Theorem 3.8—In a plane, if 2 lines are \perp to the same line, then they are \parallel .



S	R
① \sim	① Given
② $m \parallel n$	② If $\text{corr} \angle s \cong$, then \parallel .
③ $\angle 4 \cong \angle 3$	③ If \parallel , $\text{corr} \angle s \cong$

Ex 1

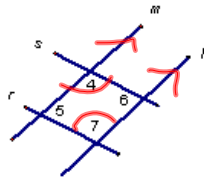
Given: $\angle 1 \cong \angle 2$
 Prove: $\angle 4 \cong \angle 3$

S.	R
① \sim	① Given
② $\angle 2 \cong \angle 3$	② Vert $\angle s \cong$
③ $\angle 1 \cong \angle 4$	③ Subst
④ $\overline{AB} \parallel \overline{CD}$	④ If alt int $\angle s \cong$, then \parallel

Ex 2

Given: $\angle 1 \cong \angle 2$
 $\angle 4 \cong \angle 3$
 Prove: $\overline{AB} \parallel \overline{CD}$

Ex 3

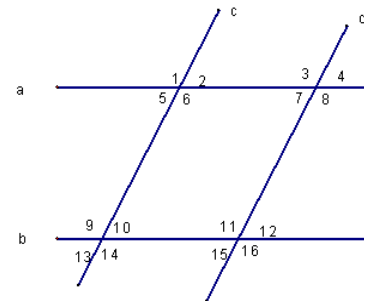


Given: $\angle 4 \cong \angle 7$
 $l \parallel m$
 Prove: $r \parallel s$

Which lines are parallel based on the given information?

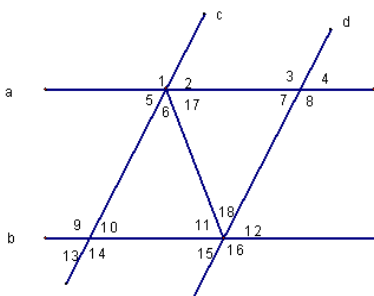
a and b OR c and d OR neither

1. $\angle 1 \cong \angle 9$
2. $\angle 13 \cong \angle 15$
3. $\angle 7 \cong \angle 12$
4. $\angle 3 \cong \angle 16$
5. $\angle 1 \cong \angle 16$
6. $m\angle 8 + m\angle 12 = 180$
7. $m\angle 2 + m\angle 3 = 180$
8. $m\angle 10 + m\angle 15 = 180$
9. $\angle 13 \cong \angle 12$
10. $\angle 1 \cong \angle 6$



11. $\angle 11 \cong \angle 17$

12. $\angle 18 \cong \angle 6$



HW

p155-156

#s 13-24, 26-31, 34